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April *23rd, 1838.*

SIR WM. R. HAMILTON, A.M., President, in the Chair.

The President continued the reading of the paper by the Rev. Dr. Hincks, on the Years and Cycles of the ancient Egyptians.

Dr. Apjohn communicated a paper upon the subject of a new and very complicated compound, consisting of iodine, iodide of potassium, and the essential oil of cinnamon.

This compound he stated to have been first observed in the winter of 1837, in a solution prescribed by a medical gentleman of this city, of iodine and iodide of potassium in cinnamon water. It is best obtained by adding to a gallon of cinnamon water four ounces of iodide of potassium, and forty grains of iodine, dissolved in a minimum of cold water. Upon admixture, the solution becomes turbid, and if the temperarature be at or close to 32°, the deposit becomes crystalline, and slowly subsides. The properties of these crystals were detailed, and a succinct account given of the different steps of the process employed for effecting their analysis.

As the result of a number of experiments, the author arrived at the following numbers, expressing the composition of 100 parts of the compound.

Iodide of potassium .	12.55
Iodine	28.14
Oil of cinnamon . .	59.31
	100.

The empirical formula deducible from these results is

$$\mathrm{IK} + \mathrm{I}_3 + ci_6$$

in which *ci* represents $C_{18}H_8O_2$, the atom of oil of cinnamon, as determined by Dumas; and the most probable rational formula he stated to be

$$\mathrm{IK} + 3\,(\mathrm{I} + \mathrm{C}i_2).$$

Calculating from this formula, its composition would be

Iodide of potassium	12.26
Iodine	28.08
Oil of cinnamon	59.66
	100.

This compound he considered interesting under many points of view; in consequence of its complexity, the peculiarities of its properties, and its presenting a case of incompatibility which had not been previously suspected. Also, as suggesting means which would probably lead to the production of an entire new series of substances having an analogous composition.

Dr. Apjohn stated, that this compound had been brought under his notice by Mr. Moore of Anne-street, and that he and Mr. Moore had investigated conjointly its properties, and the best process for obtaining it. Of the specimen exhibited to the Academy, sixty-one grains were obtained from a single gallon of cinnamon water.

Professor Lloyd read a paper "on a Declination Instrument, made for the Magnetical Observatory of Dublin." The instrument, which was made by Mr. Jones of London, was laid upon the table of the Academy.

The principle employed in this apparatus is the well known optical principle of the *collimator* of Kater. The needle is a rectangular bar, twelve inches in length; it is provided with three sliding pieces, one of which is at the middle of the bar, the other two near the ends. To the former is attached the suspension thread; one of the latter carries an achromatic lens, whose focal length is somewhat less than the length of the bar; the other, which is to be adjusted to the focus of the lens, contains a cross of wires. The rays proceeding from the cross are, under these circumstances, refracted parallel to one another, and to the line connecting it with the centre of the lens,—which may be denominated the *line of collimation* of the instrument. If, then, a telescope be placed so as to receive any portion of this parallel beam, the cross will be seen in the direction of the line just mentioned; and that, independently of the exact adjustment of the telescope.

The frame-work of the apparatus consists of two pillars of copper, firmly attached to a massive slab of marble.—The height of the pillars is eighteen inches; they are connected by two cross pieces of wood, one at the top, and the other about five inches from the bottom. In the centre of the top piece is the suspension apparatus, the plan of which has been adopted from the torsion balance of Coulomb, as described by M. Pouillet. It is provided with a divided circle, for the purpose of determining the amount of torsion of the thread, and of correcting it.

The magnetic bar, suspended by parallel silk fibres, is enclosed in a rectangular wooden box, to preserve it from the agitation of the air. A glass tube, between the two cross pieces, surrounds the suspension thread, and completes the enclosure of the instrument.

The box is entirely distinct from the rest of the apparatus; it is made in two halves, which are joined at the sides by dovetails; so that it may be put on when the needle has been fully adjusted. There is a circular window at each end of the box. That nearest the observer is made of *parallel* glass; and is contained in a frame which has a motion of rotation in its own plane. By a revolution of 180°, the prismatic error, if any, is corrected. The window at the other end of the box is for the purpose of illumination. In order to determine the internal temperature, the box is provided with a small thermometer, the bulb of which is within, and the stem (bent at right angles) on the outside front.

It is intended to employ this apparatus for three purposes; namely, to determine, first, the *magnetic declination;* secondly, the periodical and the irregular *variations of the declination;* thirdly, the corresponding *variations of the horizontal magnetic force.*

In using the instrument in the determination of the declination, it is to be combined with the theodolite and the transit instrument. The transit instrument is to be fixed close to the southern window of the observatory; there being also an aperture in the roof for the purpose of adjusting it to the meridian by means of the pole star and δ *ursæ minoris.* The centre of the theodolite is placed, as nearly as possible, at the point where the line of collimation of the transit instrument intersects that of the magnetic bar. When an observation is made, the telescope of the theodolite is directed to the lens of the magnetic collimator, and the vertical wire of the latter is made to bisect the cross in the focus of the telescope. When this is done, the line of collimation of the telescope is parallel to that of the magnetic bar. But as the latter line may not coincide with the *magnetic axis* of the bar, a similar observation is to be made with the bar inverted; and the mean of the two readings will obviously give the direction of the *magnetic meridian,* freed from the error of collimation. To determine the angle between this and the *true meridian,* the transit telescope is to be turned over, and employed as a collimator. The telescope of the theodolite being directed to its object glass, the middle wire in the focus of the transit is to be observed, in the same manner as the wire of the collimator bar was in the former part of the observation. The line of collimation of the theodolite telescope is then in the *true meridian;* and the angle read off on the limb is the supplement of the declination.

In observing the diurnal and irregular variations of the declination, the reference to the meridian is not required. Here, therefore, the theodolite and transit instrument are unnecessary, and the former will be replaced by a *fixed* telescope, furnished with a finely divided micrometer scale in its focus.

A similar apparatus serves for the determination of the changes in the horizontal magnetic force. It is only necessary to modify a little the suspension arrangement, and to substitute for the single thread *two equidistant threads;* as in the torsion electrometer of Mr. Snow Harris. The needle is then to be turned by the force of torsion, into a position at right angles to the magnetic meridian; in which position the momentum of the magnetic force is greatest. The changes of position of the bar (read off as before by a fixed telescope with a micrometer scale) will enable the observer to deduce, by an easy formula, the corresponding changes of the magnetic force. Professor Lloyd then entered into some details connected with the theory of the instrument as thus employed; and he showed in what manner it was to be adjusted, so that a given variation of the magnetic force might produce the greatest variation in the position of the bar.

A paper was read by Edward S. Clarke, Esq., on an Improvement which he had lately made in the Sustaining Battery, and on the size proper to be given to the zinc element of sustaining batteries in general.

The author alluded to the decline of voltaic power which occurs during experiment, and ascribed to M. Becquerel the credit of having assigned its true cause; referring it, as this philosopher did, to a transfer of the decomposed substances to the respective plates, in such a way as to produce secondary currents moving in a direction reverse to the primary current.

Mr. Clarke also alluded to the fact, that Becquerel was the first person who, to remedy this evil, adopted, in 1829, the use of a membranous partition, and two different liquids, to separate the respective metals; but added, that the form this philosopher adopted was imperfect, in consequence of the difficulty of affixing the membranous portion staunchly to the sides of the square glass box which contained the two different fluids.

The author, after referring to the sustaining battery of Professor Daniel and to the modification of that apparatus adopted by Mr. Mullins, exhibited to the Academy a battery which he had devised to remedy a defect affecting all previous combinations, and in which each surface of the hollow zinc cylinder had, as first recommended by Mr. Wollaston, a surface of copper opposed to it. An account was also given of several experiments which shewed the advantage of his form in calorific and electro-magnetic experiments.

Mr. Clarke's improvement consists in attaching a ring of zinc by zinc rivets to the top part of the outside of the hollow cylinder of zinc used in the arrangement of Mr. Mullins, and drawing a bladder over this cylinder, to which it is secured by a cord to the ring; and in replacing the earthenware jar by a copper cylinder, which is furnished with a mercury cup, as are also the zinc cylinder and the central copper. The central copper and the outer copper case are connected by a wire dipping into the cups. A solution of sulphate of copper is poured, as well into the outer case of copper, as into the bladder surrounding the central copper, and muriate of ammonia into the bladder enlosing the zinc.

The author concluded by detailing some experiments, tending to shew that, (contrary to the opinions of M. Marianini and Mr. Mullins,) the maximum effect is obtained when the surface of the zinc element is equal, or nearly so, to that of the copper.

Resolved, on the recommendation of the Council,—That the by-law Chap. 7, Sect. 8, be repealed, and the following substituted:

"The Council shall, from time to time, award medals, or other honorary rewards, at their discretion."

DONATIONS.

Comptes Rendus Hebdomadaires des Séances de l'Academie des Sciences. Premier Semestre, Nos. 12 and 13. Presented by the Institute.

Genealogical Tables of the Sovereigns of the World. By the Rev. William Betham, of Stonham, Suffolk. Presented by Sir William Betham.

ERRATUM

In the last Number of Proceedings.

Page 149, last line, *for* 0′.27, *read* 0′.297.